

WAR MEDICINE

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VINCENT'S ANGINA INFECTION: ITS PREVALENCE, VARIED MANIFESTATIONS, TREATMENT, AND BACTERIOLOGY.

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THE reported frequency of Vincent's angina among the Allied troops serving in France makes a consideration of this malady, and a note or two concerning its bacteriology and treatment, of interest to all concerned with the health of our own men, of whom so many will soon be serving under like conditions. Taylor and McKinstry¹ reported that "during the last few months" over 300 cases of the malady had been confirmed bacteriologically in the Queen Alexandra Military Hospital

¹ British Med. Jour., March 31, 1917, p. 421.

and that "constant presence of these organisms" (the fusiform bacillus and spirillum) had been "abundantly verified" in all forms of necromembranous inflammation of the mouth, either alone or associated with various forms of cocci, bacilli and leptothrices.²

The last-named observers report that cases of the disease, when affecting the gum margins, were often confused with pyorrhea alveolaris, although pus is usually not produced.

Bouty³ states: "During the last two years there has been a gradual and marked increase in the number of cases of Vincent's angina among the troops in France, both British and French. In time of peace this disease forms about 2 or 3 per cent. of all cases of throat complaints among the French army (recent statistics). Recent statistics from a British military hospital in France show the proportion to be as high as 23 per cent. of all throat complaints."

Campbell and Dyas⁴ reported that during the four months from October, 1916, to February, 1917, 129 cases of the disease had been treated in the Canadian military hospital at Braunschott, England.

Prevalence in the United States. I know of no statistics that would show the extent of the prevalence of the disease in this country. It has not been made reportable by any health department, and, short of this or a bacteriological examination of a large number of diseased mouths, throats, etc., in various localities, nothing exact could be known.

The literature dealing with the malady is not great, but there are sufficient reports to indicate that the malady is of universal distribution, although severe cases are not very common under normal conditions in civil practice. However, from the British experience aforementioned, we may anticipate a greatly increased incidence under military conditions.

Among civilians during the last few months I have noticed an apparent increase in the number of tonsillar and pharyngeal sugars, met with both in hospital and private practice, even over the usually increased winter incidence, that show the fusiform spirilliform organisms identified with the condition. Here it may be mentioned that, under the procedures in use at present, in order to make a laboratory diagnosis of the condition a sugar and not only a culture is required, the latter alone being sometimes sent for diagnosis.

Predisposing Causes. While general debilitating conditions, such as extreme fatigue, chilling, insufficient or improper food, excessive alcohol consumption or the presence of other debilitating disease, undoubtedly markedly influence the incidence of the infection of Vincent's angina, locally acting influences are known to be often determining. Among these are decayed, broken or dirty teeth and excessive smoking or chewing of tobacco.

Exciting Cause. This is undoubtedly the organism so constantly associated with the lesions, and which will be considered in detail under Bacteriology.

Location and Appearance of Lesions. The typical lesion consists of a heavy, dirty-looking membrane commonly covering one of the tonsils,

² Emrys-Roberts, British Med. Jour., September 15, 1917.

³ British Med. Jour., November 21, 1917.

⁴ Jour. Am. Med. Assn., June 2, 1917, p. 1596.

although it may be located any place upon the nasopharyngeal or buccal mucous membrane. It may even extend as a single membrane over most of the surface of the upper respiratory tract, as it did in one of the cases reported in this article. When the membrane is upon the tonsil it commonly either shows a crater-like excavated center or is so necrotic that slight pressure, as with the end of a platinum loop, breaks through and the probe sinks in a half-inch or more. The ulcerations of the disease often cause considerable destruction of tissue and consequent scarring.

Apart from the typical lesions, as described, we must recognize pathological processes of less severity, and which are consequently, less apt to be noticed. Such usually consist of moderate tonsillitis or gingivitis, which has a tendency to chronicity, with now and again a severe attack with lesions of the type first described. An interesting case of this character is detailed in what follows.

In view of the synchronous purpuric manifestations so intimately connected with the throat lesions in the last-mentioned case (see after), and as acute pharyngitis precedes so many cases of purpura, it may be that the specific agent of Vincent's angina has much responsibility for the latter.

Mulholland reported 16 cases of ear infection with Vincent's angina organisms.⁵

Spillman reported a case of gangrene of the vulva and perineum caused by this infection, and Noguchi reported a case of ulcer of the labia due to the same.

Vincent reported several cases of gastro-enteritis in which post-mortem examination showed large numbers of the typical organisms in the intestines.

Ulcerative balanitis due to this organism was described by Corbus and Harris as the "fourth venereal disease." In reporting several cases they declared their belief that this infection was often mistaken for chancre. The ulcers of the two conditions may resemble each other closely. In chancroids, however, the presence of the causative agent—the Ducrey-Unna bacillus—and the much greater reaction in the buboes, which often suppurate, serve to differentiate.

Bowman⁶ reported the case of a soldier with extensive ulceration in the month, a severe conjunctivitis and an ulcer on the penis (surrounding the meatus), in all of which lesions the typical organisms were found (Wassermann test negative). Four other cases with penile ulcers due to the same cause were reported by Campbell and Dyas (above).

The latter authorities also reported 7 cases in which a moderately severe bronchitis, with sputum loaded with the typical organisms, was the only lesion.

The writer examined the sputum of a patient (A. H.) suffering from chronic bronchitis in which Vincent's angina organisms were so typical and numerous that he supposed the patient to be suffering from a throat infection, but, upon inquiry, was assured by the attending physician (Dr. O. M. Leiser, New York City) that the lesion was entirely bronchial and pulmonary.

⁵ *Annals of Otol., Rhin. and Laryn.*, September, 1915.

⁶ *Lancet*, October 6, 1917.

This case was of six months' duration and manifested chronic cough, physical signs of bronchopulmonary catarrh and progressive emaciation; lost thirty pounds. The patient was sent to a tuberculosis sanatorium and, in two months, regained the loss and returned apparently recovered (no tubercle bacilli were ever found in the patient's sputum).

Another case met with by the writer recently was one of nearly daily raising of a small quantity of bronchial mucus on the part of a patient with slight chronic gingivitis. At the time of sputum examination the patient presented a slight ulceration along the inner edge of the under lip. Bronchial mucus, gum margins and lip lesion all showed the typical organisms.

Bouty (see before) reported a recurrence of Vincent's angina on the other tonsil, which was followed in three days by acute nephritis.

In articles on noma, Brault,⁷ Herriman⁸ and Rona⁹ elucidated evidence proving that this malady was caused by the same organism as Vincent's angina and that the difference in the lesions was but one of degree. Vincent¹⁰ considered hospital gangrene a form of the same infection.

Symptoms and Constitutional Effects (Throat Cases). These, while directly proportional to the severity of the process, are much less than would be expected from the appearance of the lesions.

Besides the appearances of the involved areas there usually is slight sore throat, headache, malaise, swelling of glands adjoining the ulcerations (in severe cases adenitis is often marked and painful) and a slight elevation of temperature. In severe cases the breath is always fetid. A membrane is usually not formed until the general symptoms have lasted a day or two.

More extensive general manifestations may, however, occur in some cases, as in one detailed herewith, in which nosebleed, gum hemorrhages and general purpuric manifestations seemed to be directly due to the infection. Severe cases reported from the European military hospitals have manifested great prostration, high fever and albuminuria. Recrudescences, as for instance a week or ten days after apparent recovery from an ulcerative process on one tonsil when an ulceration develops upon the soft palate or the other tonsil, have not infrequently occurred.

Several cases (in civilian practice) are recorded in the literature as having terminated fatally. Bouty (above) states that "some cases of death have occurred in French hospitals in which the primary cause was Vincent's angina."

TWO INTERESTING CASES. *Case with Extensive Membrane Formation.* C. H., aged twenty-seven years, a lawyer, under the care of Dr. Stephen De Coste, of Brooklyn, after a motor trip to Philadelphia (where he enlisted in the navy), developed a typical membrane covering both tonsils and soft palate, the entire pharynx from the glottis to the posterior nares and extending into both nostrils. The patient said he had suffered from "canker sores" in the mouth for years. The constitutional symptoms were but moderately severe.

On the second day of illness the diagnosis was made bacteriologically and a vaccine of the bacilli prepared. Treatment with the latter was

⁷ Bull. Derm. et Syph., 1908, ii.

⁸ Arch. Pediat., November, 1905.

⁹ Arch. Dermat. u. Syph., 1905, lxxiv, 171.

¹⁰ Deutsch. med. Wchnschr., 1894, xlix, 922.

begun by Dr. De Coste on the fourth day and two doses were given. Before its use, local applications of silver nitrate (10 per cent.) were made, and the case had begun to improve when the specific vaccine was begun. The vaccine was a suspension of 1,000,000,000 bacilli to 1 c.c. The very large first dose of 5 c.c. was followed by a marked local and slight constitutional reaction. Three days later a second dose of 10 c.c. was administered, with like manifestations. The patient rapidly improved, and was well by the tenth day.

Chronic and Fatal Case. E. L., aged forty-three years, a physician. Eight years ago E. L. had a chronic ulcer of his nasal septum operated upon, and three days later, besides having had continuous nosebleed in the interval, experienced an attack of general purpura with severe urinary hemorrhage lasting four days (no kidney involvement). Besides also bleeding from the gums and intestinal mucosa the patient's mouth and skin were covered with a small purpuric rash that persisted for several weeks. Since this attack the patient had numerous nosebleeds, gum hemorrhages and purpuric skin eruptions, commonly associated with a tonsillitis which showed as a typical Vincent's angina.

In this connection attention is called to a case (reported by Campbell and Dyas in an article aforementioned), with extensive membrane over the tonsils, entire mouth and lips, which developed an extensive rash four days after admission to the hospital. "The spots, about a dozen on each forearm and leg, were about one-quarter inch in diameter, sharply raised, copper colored, and the center of each contained a small oblong vesicle" (Wassermann negative).

About two months ago the patient (E. L.) suffered an attack which developed a heavy membranous ulceration upon his left tonsil and a general purpuric skin rash. The membrane lasted for about ten days and the rash gradually faded. Smears from the tonsillar membrane showed the typical organism.

As it seemed that the patient suffered from a chronic or recurrent localized infection, I suggested that a vaccine be employed. This was made to contain 1,000,000,000 bacilli to 1 c.c., and a dose of 0.2 c.c. was given ten days after the acute attack described. Within twenty-four hours a rather marked local reaction developed, also a slight bleeding of the gums and nose. At the end of three days the dose was doubled and was followed by a greater local reaction, gum- and nose-bleeding and some purpuric eruptions over the body. Owing to these undesirable consequences, use of the vaccine was suspended, with the intention to resume its use more cautiously as soon as purpuric manifestations subsided.

For a month after the use of the vaccine had been discontinued the patient enjoyed his usual fair health without, however, getting rid of his constant slight chronic gingivitis and nasopharyngeal involvement. At the end of this time he again developed an acute attack, with nasopharyngeal and several small buccal ulcerations. Bleeding was quite marked from the bowels and nose. Temperature was but slightly elevated and the pulse was but a little disturbed. The patient had a moderate bronchitis, with considerable expectoration.

After an illness of four days Dr. Raymond Clark (Brooklyn) was called to attend the patient and requested laboratory tests, which gave results as follows:

Blood. Coagulation time (drop method) complete, five minutes; erythrocytes, 3,144,000; size, shape and staining were normal; hemoglobin, 60 per cent.; plaques, 90,000 per cu. mm.; leukocytes, 8800 (neutrophils, 70 per cent.; eosinophiles, 1 per cent.; large lymphocytes, 11 per cent.; small lymphocytes, 12 per cent.; large mononuclears, 6 per cent.); culture, negative.

Feces. For ova, negative.

Sputum. Many typical Vincent's bacilli and spirilla, few or no other organisms.

Urine. Negative.

Smears. From accessible ulcerations and tonsils showed Vincent's organism to a practical exclusion of others.

At this time the bleeding from the bowels and nose had ceased, but the patient complained of severe frontal headache. For the next three days his condition remained about the same, treatment being directed to relieving his headache. Dr. Clark gave him aspirin for this, and then, when it proved insufficient, codein. At the end of the three days mentioned the patient's head pains had shifted to the left side of the head and neck and extended into the shoulder. They were evidently very severe. On the fourth day of Dr. Clark's attendance (eighth of the attack) the patient rapidly became weaker and died from what Dr. Clark diagnosed as "petechial brain hemorrhage, followed by brain edema."

From the evidence given above it seems reasonable to conclude that Dr. L. died from Vincent's angina infection.

TREATMENT. Preventive. It has been reported (Campbell and Dyas above) that 50 per cent. of smears made from the throats of all the troops in a military hospital showed the presence of the organisms of Vincent, so it is evident that the infection must be well-nigh universal. However, before a definite lesion can develop, certain predisposing causes must act. These it is believed have principally, if not entirely, to do with the condition of the teeth and the care given them. The predisposing influences of the irritating effects of tobacco have been mentioned.

Thus it is necessary to have the teeth of all, especially of those entering the military forces, put in the best order possible, and in addition that daily use of the tooth-brush be made.

Excessive use of tobacco should be avoided. Other predisposing conditions to be avoided, if possible, would be, of course, exposure and debility from any cause.

Curative. Taylor and McKinstry painted the lesions daily with a solution of salvarsan (strength not given, but presumably quite concentrated). They state:

"When found to be present the peridental gingivitis should be adequately treated as well as the Vincent angina, otherwise the condition is likely to persist indefinitely and to cause repeated recurrence of the sore throat."

Bowman¹¹ had great success with the following: wine of ipecac, $\frac{1}{2}$ ounce; glycerin, 1 dram; Fowler's solution, 3 drams—the mixture to

¹¹ Proc. Roy. Soc. of Med., 1916, ix, 51; and Lancet, October 6, 1917.

he either painted over the lesions or used as a mouth wash, with directions not to swallow any of it.

Emrys-Roberts (above) says that the treatment that has met with unvarying success since its adoption in the area served by his "Mobile Bacteriological Laboratory, B. E. F.," in France, consists in the local application of a lotion composed of hydrogen peroxide, 5 ounces; wine of ipeca, 3 drams; glycerin, 5 drams; water, 2 ounces.

Mercury in any form is stated to aggravate the condition, owing to its well-known injurious effect upon the gums and mucous membranes.

Scargill¹² recommends the "topical application of ordinary tincture of iodine, twice a day." Campbell and Dyas (quoted before) recommended the mouth wash used by Bowman for gingival manifestations, or Fowler's solution alone, swabbed on three or four times a day, for lesions elsewhere. If an ulcer be deep they recommend to paint it once with 10 per cent. silver nitrate solution before beginning the Fowler solution applications. In severe cases the latter recommend salvarsan intravenously or large doses of Fowler's solution internally.

Treatment usually is followed by recovery within a week in the majority of instances.

BACTERIOLOGY. Lesions. Smears made from lesions caused by the infection of Vincent's angina show the organisms in a form which varies with the extent of the pathological process. Thus superficial lesions tend to show few or no spirilla, while the bacillus forms are numerous and often varied in shape and size; the typical fusiform bacillus seems to be intermediate between a shorter and a more nondescript shape and the spirilla developments. These latter (the spirilla forms) are seen only in smears made from the deeper ulcerations after some destruction of tissue has occurred.

From the above considerations and the fact that the organism is known to appear as wavy threads among the cells of still living tissue into which it has penetrated,¹³ it seems reasonable to conclude that the spirilla forms result from the disintegration of such infected areas. This theory is also borne out by the poor staining quality of the spirilla forms, which would be, as it is, were they old and degenerating. Furthermore, in smears from ulcers caused by the infection we may usually find spirilla linked with fusiform bacilli.

Cultivation. Morphology. In a somewhat extended experimentation with organisms from these conditions I have been able to obtain some results previously announced by others as follows:

Tunncliff¹⁴ grew cultures of organism in bacillus form, under anaerobic conditions; transferred plants from such anaerobic cultures and secured growth on Loeffler's solidified blood serum at room temperature; obtained filamentous growth and spirilla forms on this medium.

Noguchi¹⁵ reported that in old cultures, bacillus forms degenerate and often develop larger spherical forms which sometimes appear attached to short forms. It seems to me that these are nothing but the

¹² British Med. Jour., October 6, 1917, p. 469.

¹³ This is the case in sections taken from the edge of the still living tissue in cases of noma (see Herman, Arch. Pediat., November, 1905). Tunncliff (quoted elsewhere) grew the Vincent's angina organism from the lesions of noma.

¹⁴ Jour. Infect. Dis., April, 1911.

¹⁵ Jour. Exper. Med., September, 1912.

result of involutionary vacuolization or of the processes common in spore formation (so-called). The granulation process produces forms indistinguishable from cocci.

Campbell and Dyas (quoted before) reported that they found when the organism was "grown anaerobically in ascitic broth containing a piece of tissue—after three or four weeks—a few living spirochetes, very numerous granules and numerous empty shells of spirochetes."

On culture the fusiform bacilli tend to lose their tapering appearance and the spirilla forms ordinarily do not appear. I have noticed that whenever a colony of the bacilli on solidified blood serum produces a digestion of the medium, spiral threads, without septa, are commonly produced, and the same is true of growths on fluid blood-serum media. On this latter, after two or three days' incubation (at 37.5° F.), many of the threads or strings of bacilli will be seen to terminate in a distinct spiral formation, smaller and less distinctly stained than the main portion of the thread. This appearance, when compared with the poor staining of the spiral forms in smears from the lesions and the fact that the spiral forms in the latter are frequently to be seen linked with fusiform bacilli, as previously mentioned, makes it very plain that the two forms—spirilla and fusiform bacilli—are one and the same organism. This belief is well-nigh universal among authorities.

The spiral formation is therefore evidently a degenerating non-septate strand of bacilli, curved in growth, perhaps, and curling more as it shrinks and staining but slightly.¹⁶

The organism grows under either aerobic or anaerobic conditions, on suitable media, but the activity of any growth varies with the strain, or rather with any peculiarities that it may show at the time experimented with. Such qualities seem to depend upon the immediate ancestry and environmental conditions which acted upon the same. Thus, I have seen a most actively growing culture which formed a thick pellicle upon serum bouillon (and had been cultivated thereon for several generations) fail to grow when a piece of the pellicle was transferred to solidified Loeffler's blood serum.

The organism from C. H., a case reported in this article, when first isolated would not liquefy Loeffler, while that from E. L. (the purpuric case) did. The Loeffler liquefying form shows Gram-positive polar bodies.

The range of temperature at which the organism grows includes "summer heat" (70° F.), so that it is evidently saprophytic.

The culture obtained from the case of E. L., grew well on excised guinea-pig tissue (spleen and kidney), forming a thick pellicle, and penetrating and liquefying the kidneys. In form it was similar to that developing on serum bouillon.

General Morphology. The bacilli, in smears from lesions and sometimes from cultures, exhibit, when stained, transverse non-staining bands which vary in number, usually with the length of the organism. Some bacilli, when short and possessing but a single band (bipolar

¹⁶ It should be mentioned, to prevent an impression that such qualities in a bacillus would be unique or extraordinary, that even on artificial cultivation many bacilli show spirilla-like forms—for instance, the *Bacillus lactis albus* (an organism found in milk) produces many distinct spiral forms on nutrient agar.

baeilli), are indistinguishable from diplococci. Some of the spiral forms frequently exhibit similar markings.

The organism when degenerating develops the so-called sporulating form (vacuolization) and granules can be seen escaping from the ends.

The organism is motile, apparently possessing a single terminal flagellum. Unless showing polar bodies (granules) the organism is Gram-negative. When the granules exist they are Gram-positive.

Animal Experiment. Bouty reported (see before) that "injection of impure cultures causes abscesses in which the spirochete is abundant."

In a number of trials on two rabbits I failed to produce mouth lesions by the injection of serum-bouillon cultures beneath the mucous membrane. However, I succeeded in producing a small ulceration near the meatus on the penis of a rabbit. I had first injured the inside of the rabbit's foreskin by applying a hot piece of platinum foil and then applied several loops of culture. No growth took place at the site of the burn and the ulcer developed upon the opposite side of the glans.

The organisms in this ulcer were nearly entirely bacillary, but an occasional spirillum could be seen.

The Problem of the Amebic Dysentery Carrier in India and Mesopotamia.—MACADAM and KEELAN (*Indian Jour. Med. Research*, July, 1917) discovered *Entameba histolytica* in apparently normal stools of numerous cases in the surgical division of the hospital, as well as in the medical wards, other than those assigned to dysentery. A systematic examination was then commenced and the present report is based upon the protozoological investigation of over 2000 men, mostly of the Mesopotamian field force, whose condition ranged from general good health to one associated with acute and chronic intestinal disturbances. Their records show that *histolytica* infection is so frequent that efforts at prophylaxis should be directed entirely to the purely sanitary aspect of the question. They believe that the segregation of any but the "gross" human carriers will remain an impossible and futile task until our therapeutic methods or the destruction of the cysts are more certain and effective. The results of treatment make doubtful the utility of attempting to clear men of *histolytica* infection while living under war conditions, or even while they continue to live in the tropics. Thus in a series of patients who gave an average of five negative examinations in hospital, after a residence of one week in the Convalescent Depot, a single re-examination of the feces revealed the persistence of the infective agents in one-half of the cases. This shows the futility of any scheme for the clearing of dysentery patients where the protozoological examinations are entirely confined to the period during which the patients are resident in hospital. Also since 17 per cent. of total number of *histolytica* carriers, which they detected, gave no past history of dysentery, or marked diarrhea, they question the military advisability of prolonged segregation of dysenteric convalescents, who are otherwise healthy. By comparison with the findings of Dobell (*Medical Research Committee, Special Report Series No. 4, 1916*) it is found that the incidence of protozoal infection is distinctly higher in the Mesopotamian troops examined while still in the tropics, than in those patients who have returned to a more temperate climate.

W. H. F. A.

Diseases of the Suprarenals in Soldiers.—RAMOUD and FRANÇOIS (*Bull. Soc. Méd. Hôp.*, Paris, October 12, 1917) encountered 26 cases of disease of the suprarenals in their sector since last May. This is a higher proportion than would be found in times of peace, and it is inferred that the lowered resistance of the suprarenal is to be associated with the increased demands upon it produced by the continued mental and physical tension resulting from the war. This tension affects also other organs but especially the suprarenals which respond rapidly to various nervous stimuli, and which exercise control over the tonicity of various systems. Other authors have reported on evidences of suprarenal insufficiency as seen in cases with asthenia and psychasthenia, low blood-pressure and tachycardia and various gastric disturbances. Certain infectious diseases show more distinctly than in times of peace the mark of hyposecretion of the suprarenals such as typhoid and the paratyphoid fevers, dysentery, malaria, diphtheria, scarlatina, and diverse septicemias. Vaccinations against typhoid and paratyphoid fevers sometimes cause marked disturbances of the functional activity of the gland. It is probable also that the asthenia so pronounced in those who have been gassed originates in great part from the same cause. The authors think it is this overexhaustion of the gland which exposes it to tuberculous infection. In this series of twenty-six, the suprarenals were tuberculous in nearly all, but rarely did the patients have pulmonary tuberculosis. Only four survived. Two of these showed evidences of associated hyperactivity of the thyroid, and the authors believe that inasmuch as the thyroids can function vicariously for the suprarenals, this thyroid hypertrophy was the means of defence. This idea is elaborated in the same journal, November 29, 1917 (p. 1131), where the clinical history of one of these two patients is given in detail. The patient had been at the front for two years without wound or illness. Then he began to experience great fatigue, and in three months showed clearly all the characteristics of disease of the suprarenals. Three months later when being examined he was found also to have an hypertrophied thyroid and other signs of Basedow's disease. This was six months after the beginning of the adrenal disease, and at this time, according to the declaration of the patient the feeling of fatigue began to diminish and the cutaneous pigmentation seemed to decrease. At any rate it is certain that during the two months he was under constant observation the skin did not continue to pigment, and in general the patient looked as if he were only at the beginning of suprarenal disease, not in the fifteenth month of it. The authors deduce that suprarenal disease complicated with Basedow's disease is relatively less serious than that of suprarenal disease alone. They also found that combined suprarenal thyroid opotherapy is the medication of choice in Addison's disease, but that even with this treatment, the results were markedly favorable in only three out of twenty-two cases.

W. H. F. A.

Eye Changes in Trench Nephritis.—KIRK (*British Med. Jour.*, January 5, 1918) examined a series of between 70 and 80 cases which had come to Malta from the Macedonian front. They were chiefly young men, and on arrival nearly all were seriously ill. At that time the fundi of a number of the patients were examined, and almost invariably

there was found marked retinal congestion with large pulsating veins. Some weeks later several complained of eye symptoms, and these on examination showed definite swelling of the optic disk with patches of retinal exudation. The whole series was then examined carefully, which was about three months after the onset of the illness. In those patients who were still severely ill, showing often a large quantity of albumin in the urine and sometimes blood, definite retinal changes were more distinct than in the patients who were convalescent. In these severe cases the spots of exudation were seen in the usual situations, near the disk and in the macular area. As the nephritic condition improved the smaller patches of exudation were gradually absorbed. Hemorrhages were not common, and those seen were of the small punctate variety, and not of the striate or flame-like character. The optic disk was often affected, the changes varying from a definite swelling to slight woolliness and indistinct edges. Small areas of edema were noticed especially along the course of the veins. The author suggests that the pathology is probably an acute congestion resulting from some specific toxin, that the exudation which ensues is partly lymphatic and partly cellular in nature, and that this deposit probably clears up in the great majority of cases, without leaving any permanent result. So the condition is one which is probably allied to the acute retinitis of pregnancy, scarlatina and acute uremia, and not to be confounded with the retinitis of chronic kidney inflammation with the accompanying permanent changes in the retinal circulation vessels and tissues.

W. H. F. A.

The Tuberculous Army Recruit.—GAFFIKIN (*British Jour. of Tuberculosis*, January, 1918), while serving at a rest station behind the lines, made careful chest examinations of a large number of cases sent back for various minor ailments. During a period of four months he found the complete clinical picture of pulmonary tuberculosis in 1.9 per cent. Of these cases only a small fraction, about one-fifteenth, gave a history of previous tubercular disease. The conclusion is drawn that, as all these had been picked men, passed as fit for general service, a large proportion must have developed clinically observable phthisis during their service. This directly contradicts those who assert that the outdoor life of the soldier, the abundance and excellence of army rations, the regular hours and discipline of army life might be regarded as providing an excellent set of conditions for the recruit who shows signs of pulmonary tuberculosis either latent or arrested. The factor which outweighs all these is, according to the writer, the absence of rest. There is no rest in the trenches, and even when the unit leaves the trenches there is no adequate rest. Hence the French plan is commended, that a definite history of tuberculosis, with the exception of tuberculous lymphadenitis, should be regarded as a bar to enlistment for active service.

W. H. F. A.